



Department of Energy
Carlsbad Field Office
P. O. Box 3090
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JUL 19 2004



Mr. Steve Zappe, Project Leader
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, New Mexico 87505-6303

Subject: Transmittal of the Certification Audit Report for the Lawrence Livermore
National Laboratory (A-04-25)

Dear Mr. Zappe:

This letter transmits the Lawrence Livermore National Laboratory (LLNL) Audit Report for the processes performed to characterize and certify waste utilizing the services of the Washington TRU Solutions (WTS) Central Characterization Project (CCP) as required by Section II.C.2.c of the WIPP Hazardous Waste Facility Permit. The report contains the results of the certification audit performed for the processes for the characterization and certification of waste. The audit was conducted May 4-7, 2004.

An electronic version of audit documentation (Final Audit Report, B-6 Checklists, and the audited plans and procedures) is included as a courtesy for use by NMED, but is not to be regarded as the formal submittal.

I certify under penalty of law that this document and all enclosures were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Please contact the CBFO Quality Assurance Manager, Ava L. Holland, at (505) 234-7423 should you have any questions concerning this audit report.

Sincerely,

R. Paul Detwiler
Acting Manager

Enclosure

040741



Mr. Steve Zappe

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JUL 19 2004

cc: w/o enclosure

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CBFO QA File	
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U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

FINAL AUDIT REPORT
OF THE
LAWRENCE LIVERMORE NATIONAL LABORATORY
UTILIZING THE
CENTRAL CHARACTERIZATION PROJECT

AUDIT NUMBER A-04-25

May 4 – 7, 2004

TRANSURANIC WASTE CHARACTERIZATION AND
CERTIFICATION PROGRAM



Prepared by:

Thomas Putnam
Thomas Putnam, CTAC
Audit Team Leader

Date:

7-19-04

Approved by:

Ava L. Holland
Ava L. Holland, CBFO
Quality Assurance Manager

Date:

7-19-04

1.0 EXECUTIVE SUMMARY

Carlsbad Field Office (CBFO) Audit A-04-25 was conducted to evaluate the adequacy, implementation, and effectiveness of the Lawrence Livermore National Laboratory Central Characterization Project (LLNL/CCP). This audit was conducted May 4 – 7, 2004, in Livermore, California, and evaluated the CCP transuranic (TRU) waste characterization and certification activities related to Summary Category Group S5000, debris waste. The audit team assessed the adequacy, implementation, and effectiveness of both technical and quality assurance (QA) activities.

The audit scope and methodology consisted of an extensive review of characterization activities, interviews with CCP personnel, and reviews of batch data reports (BDRs) and other documentation associated with each of the characterization techniques. Evaluation of completed BDRs and associated documentation provided objective evidence of proper implementation of the various characterization processes. This assessment confirmed the CCP programmatic interfaces established with LLNL, the CCP administrative controls needed to manage the characterization activities, and the characterization processes and activities conducted at LLNL. The activities evaluated included characterization with a mobile real-time radiography (RTR) system, visual examination (VE), and the on-line integrated system for headspace gas (HSG) sampling and analysis. In addition, the process for developing acceptable knowledge (AK) documentation was evaluated.

The audit team concluded that the CCP technical and QA procedures were adequate relative to the flow-down of requirements from the CBFO Quality Assurance Program Document (QAPD) and the Waste Analysis Plan (WAP) of the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP). The audit team also concluded that the assessed activities, with the exception of an issue involving the AK Summary Report, were being satisfactorily implemented in accordance with the CCP Quality Assurance Project Plan (QAPjP) and implementing procedures. The established technical processes and the QA program and procedures were also determined to be satisfactorily implemented and effective.

The audit team identified one condition adverse to quality (CAQ) resulting in the issuance of a CBFO corrective action report (CAR). CAR 04-020 identified a CAQ concerning the AK Summary Report that detailed the combining of drums containing solids with a debris waste stream. This CAR was deemed to be non-significant because the waste has not been shipped. Seven isolated deficiencies requiring only remedial corrective actions were corrected during the audit (CDA). No Observations resulted from the audit and five Recommendations were offered for management consideration. The CAR, CDAs, and Recommendations are described in Section 6.

2.0 SCOPE

CBFO Audit A-04-25 was conducted to evaluate the adequacy, implementation, and effectiveness of the CCP QA Program and technical processes used to perform TRU waste characterization activities for retrievably stored debris waste located or generated at LLNL.

In addition, the audit team examined activities and documentation that confirmed the adequacy, implementation and effectiveness of the characterization processes conducted at LLNL for RTR, VE and HSG, in accordance with CCP implementing documents. The audit team also evaluated the processes for developing and confirming AK documentation.

The following QA elements were evaluated in accordance with the CBFO QAPD:

- Organization
- QA Program
- Personnel Qualification and Training
- Quality Improvement
- Documents and Records
- Work Processes
- Assessments
- Sample Control

The following technical elements were evaluated to verify compliance with the WAP:

- Data Validation and Verification (V&V)
- Acceptable Knowledge (AK)
- Real-Time Radiography (RTR)
- Visual Examination (VE)
- Headspace Gas Sampling and Analysis (HSG)
- Sample Design
- Performance Demonstration Program (PDP)
- Waste Certification activities (e.g., Waste Stream Profile Form)
- WIPP Waste Information System (WWIS)

The evaluation of waste characterization and certification activities and documents was based on current revisions of the following documents:

- *Quality Assurance Program Document (QAPD)*, DOE-CBFO-94-1012
- *Hazardous Waste Facility Permit Waste Isolation Pilot Plant EPA No. NM4890139088-TSDF*, by the New Mexico Environment Department, dated October 27, 1999, including all applicable modifications

Programmatic and technical checklists were developed from the current revisions of the following documents:

- *CCP Transuranic Waste Quality Assurance Characterization Project Plan (QAPjP)*, CCP-PO-001
- *CCP Transuranic Waste Certification Plan*, CCP-PO-002
- *CCP/LLNL Interface Document*, CCP-PO-014

- Related CCP QA and technical implementing procedures (see Attachment 2)

3.0 AUDIT TEAM, INSPECTORS, AND OBSERVERS

AUDITORS/TECHNICAL SPECIALISTS

Steve Calvert	QA Manager, CBFO Technical Assistance Contractor (CTAC)
Thomas Putnam	Audit Team Leader, CTAC
Prissy Dugger	Auditor, CTAC
Porf Martinez	Auditor, CTAC
Charlie Riggs	Auditor, CTAC
Pete Rodriguez	Auditor CTAC
Jim Schuetz	Auditor, CTAC
Jimmy Wilburn	Auditor CTAC
Dick Blauvelt	AK Technical Specialist, CTAC
Wayne Ledford	Nondestructive Evaluation (NDE) (RTR) and VE Technical Specialist, CTAC
Patrick Kelly	Nondestructive Assay (NDA) Technical Specialist, CTAC
B.J. Verret	HSG Technical Specialist, CTAC

INSPECTORS/OBSERVERS

Dorothy Gill	New Mexico Environment Department (NMED)/Trinity
Steve Holmes	NMED
Bob Thielke	NMED/TechLaw
Steve Zappe	NMED

4.0 AUDIT PARTICIPANTS

A pre-audit conference was held in the conference room of Building 482 on May 4, 2004. Daily management briefings were held with LLNL/CCP to discuss the progress of the audit and potential deficiencies. The audit was concluded with a post-audit conference held in the conference room of Building 5475 on May 7, 2004. Attachment 1 contains a list of the LLNL/CCP personnel contacted during the audit.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy, Implementation, and Effectiveness

The audit team concluded that the documented technical and QA programs for the LLNL/CCP TRU waste characterization processes adequately reflect the appropriate requirements from the CBFO QAPD and the WIPP HWFP. The audit team also concluded that, with the exception of an issue involving the AK Summary Report, the documented technical and QA programs are being satisfactorily implemented, and are effective.

5.2 Technical Activities

Each technical area audited is discussed in detail in the following sections. The method used to select objective evidence is discussed, the objective evidence used to assess compliance with the HWFP is cited briefly (and in detail on the checklist), and the result of the assessment is provided.

If a question could not be satisfactorily answered, an audit concern was identified. Concerns that were corrected during the audit are discussed in Section 6.2. CAR 04-020 was prepared to document those items not adequately addressed during the audit. A CAR allows CBFO to track the LLNL's efforts to remediate the deficiency identified in the CAR. CARs are addressed in Section 6.1. One CAR and seven CDAs were issued as a result of this audit.

5.2.1 Table B6-1 WAP Checklist

The B6-1 WAP checklist addresses program requirements from an overall management perspective. It documents the verification that the waste characterization strategy as defined in the WAP is implemented by using controlled procedures. This audit was performed to assess LLNL's ability to perform TRU waste characterization and certification as it relates to S5000 (debris) waste. Objective evidence to evaluate the implementation of the associated characterization activities was selected and reviewed. Batch data reports, sampling records, and training documentation for personnel were included in the evaluation. The audit included direct observation of actual waste characterization activities (HSG, VE, RTR, and WWIS data entry). The characterization process involves:

- Collecting raw data
- Collecting quality assurance/quality control (QA/QC) samples or information
- Reducing the data to a useable format, including a standard report
- Review of the report by the data generation facility and the site project office
- Comparing the data against program data quality objectives (DQOs)

The flow of data from the point of generation up through project-level V&V was reviewed to ensure that all applicable requirements were captured in the site operating procedures. The generation-level data reviews are implemented and are required by the process procedures for NDE (RTR], HSG, and VE. The generation-level reviews were verified through review and evaluation of BDRs and associated documentation. The project-level reviews are accomplished in accordance with Procedure CCP-TP-001, *CCP Project Level Data Validation and Verification*. The audit team verified that the procedure adequately addresses the requirements of the CCP QAPJP. The audit team reviewed RTR, VE, and HSG BDRs and determined that overall, the V&V processes at both the generation and the project levels were adequate, satisfactorily implemented, and effective.

During the audit, LLNL demonstrated compliance with the characterization requirements of the HWFP through documentation and by performing the characterization activities. LLNL provided HSG sampling batch data reports LL04-HSG-0001 and LL04 HSG-0004 (containing sampling and gas analytical batch information). Copies of these batch data reports are included in Attachment 4.

The batch data reports reviewed and the sampling processes observed were found to be acceptable.

The audit team evaluated the WWIS data entry process and verified that the process and the implementing CCP procedures were in compliance with the requirements of the CCP QAPjP and CCP TRU Waste Certification Plan. The evaluation included a demonstration of manual data transfer to the WWIS and a QA validation of the data entered. It was demonstrated that data could be successfully input into the WIPP database. The generation of records packages was demonstrated, including the printed and verified data entry forms and WWIS acceptance reports.

Two concerns regarding software were identified. First, the Software Information Summary (Software Inventory List) needed to be updated to show the requirement of software application HGASCAL Rev2.xls, which has been superseded by HSG03-A2.xls. This concern was corrected during the audit (CDA 6).

The second concern involved the "HGAS System Software" software information summary line items, which show adequate status of these applications. It was recommended that notes be added to each line item to indicate the major components of the suite (e.g., add "HGAS II.exe", "HGAS II121.bin", and Analysis.exe" component names to the "HGAS System Software" line item). This will provide notification to users of all major components that are installed for the suite. The inventory is adequate as presented and the recommendation is to show these line items in a similar fashion as other suite/component items are shown on the inventory (see Recommendation 3).

A concern regarding training was also identified. CCP technical supervisors review training materials, but there is no method to document the review on the qualification card. It was recommended that a signature/date line be added to the qualification card to document this review (Recommendation 4).

The audit team examined PDP documentation and interviewed CCP personnel. The audit team verified that the CCP had successfully passed PDP Cycle 18 for HSG.

5.2.2 Table B6-2 Solids and Soils/Gravel Sampling Checklist

Table B6-2 is not within the scope of this audit.

5.2.3 Table B6-3 Acceptable Knowledge Checklist

This audit was performed to assess LLNL's ability to characterize S5000 debris waste. Items on the AK checklist are intended to ensure that LLNL has an AK process in place to:

- Train personnel in data collection requirements
- Assemble collected data into a coherent narrative detailing waste generation and constituents
- Segregate the waste into like waste streams
- Provide Resource Conservation and Recovery Act (RCRA) characterization for those waste streams
- Confirm those characterizations using sampling and analysis
- Provide an auditable set of records to support the characterization

The program is being conducted for LLNL by the CCP staff utilizing relevant CCP procedures.

The audit team examined AK documentation for two debris waste streams. The first is a mixed debris waste stream generated from 7/19/85 to 10/23/02 in Buildings 151, 235, 251, 332, and 419, with the bulk of the waste coming from Building 332. The second stream is a non-mixed debris waste stream segregated and generated beginning on 2/1/96, based upon a comprehensive analysis of prospective waste generation, particularly with respect to the presence or absence of RCRA contaminants. The population of containers in this stream includes waste generated through 8/7/02. The bulk of future generation is anticipated to be non-mixed debris with a much smaller number of mixed waste drums expected in the next 20 years, averaging two drums per year. The AK Summary Report CCP-AK-LLNL-001 R.0, *Central Characterization Project Acceptable Knowledge Summary Report for Lawrence Livermore National Laboratory Waste Streams: LL-T002-S5400 and LL-M001-S5400*, dated 2/9/04, provides the WAP and WAC required information for both waste streams. A comprehensive review of this document was conducted by the audit team and a recommended list of corrections and clarifications was provided to the Acceptable Knowledge Expert (AKE) as part of the audit process. Recommendation 5, regarding changes to the LLNL AK Summary, was presented for management consideration.

In addition to reviewing the AK Summary Report, the audit team requested and reviewed all appropriate AK attachments supporting the AK Summary and also examined several AK source documents. Nonconformance reports (NCRs) dealing with prohibited items in the mixed debris stream were reviewed, along with examples of the resolution of discrepancies in the AK record. To date, there have been no identified discrepancies between the AK record and confirmatory testing for these streams. Confirmatory testing has only been conducted on the mixed debris waste stream to date. The audit team reviewed confirmatory testing BDRs for the five containers that

have been through all required confirmatory tests and project level V&V. A draft Waste Stream Profile Form and attachments were also reviewed for this stream, along with other AK documentation supporting the elements of the B6-3 checklist. The audit team also reviewed AK documentation that supports TRUPACT-II Authorized Methods for Payload Control (TRAMPAC) requirements for the issue of sharps/heavy objects and found that the RTR procedure did not specifically direct the operator to look for these items. This concern became CDA 7 with the issuance of a revised procedure.

CBFO CAR 04-20 was issued to the AK program as a result of the combining of containers of absorbed or solidified liquids that clearly fit the definition of the Solids Summary Category Group S3000, into the mixed debris waste stream. Nevertheless, the AK Program was judged to be adequate with regard to addressing the WAP and WAC requirements and satisfactory and effective in implementation and compilation of AK information.

5.2.4 Table B6-4 Headspace Gas Checklist

The audit team evaluated the sampling and analysis procedures for HSG, as performed by the CCP on-line integrated system. The sampling and analysis processes were verified via review and evaluation of the documents and records generated as a result of procedural requirements.

During the audit, HSG sampling of LLNL drums was evaluated. The analysis via online HSG sampling and analysis unit HSG-05 was observed during a demonstration on May 4, 2004.

Drum sampling operations, BDR preparation, and BDR V&V through the data-generation level were examined. Analysis of the PDP for Cycle 18A was also evaluated.

A demonstration of sampling and analysis operations was performed for the audit team on May 4, 2004. Drum equilibration time and drum age criteria (DAC) were checked and acceptable. HSG online sampling and analysis equipment was verified. Initial and continuing calibration, bromofluorobenzene (BFB) tune, and quality control (QC) sample results were verified to be acceptable. Operator qualification and training was satisfactory. PDP Cycle 18A results were verified to be acceptable.

BDRs LL04-HSG-0001 and LL04-HSG-0004 were examined. Data generation-level V&V by the Independent Technical Reviewer (ITR), Technical Supervisor (TS) and Quality Assurance Officer (QAO) on these two reports was satisfactory. The audit team determined that the HSG operations and sampling and analysis processes were satisfactory and the equipment was compliant with the WIPP WAP.

The audit team identified seven concerns that were corrected during the audit or were submitted as Recommendations. Procedure CCP-TP-056, attachment 4 had several compounds misspelled. Three are listed as alkanes instead of alkenes (see CDA 1). Method detection limit (MDL) values were listed in the Method Detection Limit Report as

ng/0.0100 ml, rather than ng, as required (see CDA 2). BFB reported in the BDRs is the first "passing" BFB scan, instead of the apex scan, as required (see CDA 3). Initial calibration (ICAL) percent relative standard deviation (%RSD) is shown as " $\leq 35\%$ ", not " $< 35\%$ ", as required (CDA 4). Procedure CCP-TP-091, attachment 18 requires target analyte list (TAL) ions to be $\pm 20\%$ instead of the required $\pm 30\%$ (CDA 5). These were isolated deficiencies that were corrected during the audit. The audit team recommended changing the Procedure CCP-TP-090 title to accurately describe the system being used (Recommendation 1). It was also recommended that the PDP coordinator be informed that the system being used is "HSG-05" and not "HGAS-05" (Recommendation 2).

The audit team determined that the CCP HSG sampling and analysis operations were adequate, satisfactorily implemented, and effective.

5.2.5 B6-5 Radiography Checklist

The audit team evaluated the procedures and examined the documentation generated as a result of the operation of the mobile RTR system. BDRs (LL04-NDE-0001, LL04-NDE-0002, and LL04-NDE-0007) were reviewed and evaluated, along with the associated videotapes. The completed training records for all of the NDE operators were reviewed to assure that proper training was completed in compliance with the requirements of the WAP.

The audit team determined that the CCP RTR process procedures were adequate, satisfactorily implemented, and effective.

5.2.6 B6-6 VE Checklist

The audit team evaluated the VE operations performed by CCP personnel. The VE operations were confirmed via review and evaluation of the documented objective evidence generated as a result of the implementing procedures. The audit team examined VE BDRs LL04-VE-0001 through 0008. The audio/video recordings for BDRs LL04-VE-0001, 0003, and 0007 were also reviewed. The completed training records for the VE experts and VE operators were verified to assure that proper training was completed in compliance with the requirements of the WAP.

The audit team determined that the VE processes were adequate, satisfactorily implemented, and effective.

6.0 **CARs, CDAs, OBSERVATIONS, AND RECOMMENDATIONS**

CAR 04-020 briefly described below was initiated as a result of Audit A-04-25, and has been transmitted to CCP management under separate cover.

6.1 **Corrective Action Reports**

During the audit, the audit team may identify conditions adverse to quality (CAQs) and document them on corrective action reports (CARs).

Condition Adverse to Quality (CAQ) – Term used in reference to failures, malfunctions, deficiencies, defective items, and nonconformances.

Significant Condition Adverse to Quality – A condition which, if uncorrected, could have a serious effect on safety, operability, waste confinement, TRU waste site certification, compliance demonstration, or the effective implementation of the QA program.

CBFO CAR 04-020

In the AK Summary Report for LLNL, CCP-AK-LLNL-001, R.0, dated 2/9/04, a mixed debris waste stream is identified that is generated by the major TRU facilities on-site, including Buildings 332, 251, and 419. The description of the waste stream includes the presence of smaller containers of solidified liquid waste, both organic and inorganic, solidified using a variety of solidification agents. The statement is made on page 63 that “there are individual containers with greater than 50% by volume homogeneous solids (solidified liquids); however, the overall average is significantly less than 50 percent.” There are, in fact, at least 27 containers in the inventory that are primarily solidified liquids. The consolidation of two summary category groups into one debris stream was not justified based on the information presented.

Corrective actions have been taken and CBFO CAR 04-020 has been closed. Details are contained in Attachment 3, Corrective Action Supporting Documentation.

6.2 Deficiencies Corrected During the Audit (CDAs)

The audit team identified the following seven conditions adverse to quality that were considered isolated deficiencies and were corrected during the audit.

CDA 1

CCP-TP-056, attachment 4 has compounds misspelled. Three compounds are listed as alkanes instead of alkenes. WAP Table B3-2 requires alkenes to be listed.

Procedure CCP-TP-056, attachment 4 was revised during the audit. The audit team reviewed the changes and determined they were acceptable.

CDA 2

The MDL values listed in the MDL report were being reported as “ng/0.100 ml” and not “ng” as required. WAP Table B3-2 requires the values to be in “ng”.

The MDL report was revised. The audit team reviewed the changes and determined they were acceptable.

CDA 3

BFB was being reported in the data packages as the first "passing" BFB scan. CCP-TP-090, section 4.2.1[h] Note, details how BFB is to be evaluated using the Apex scan. SW-846 method 8260 B section 7.3.1.1 requires the Apex scan.

BFB reporting was revised to use the Apex scan. The audit team reviewed the changes and determined they were acceptable.

CDA 4

ICAL %RSD is " \leq " 35%, while the WAP requires "<" 35%. CCP-TP-090 also requires "<" 35% in the text and Table 8.

ICAL %RSD limits were revised to meet requirements. The audit team reviewed the changes and determined they were acceptable.

CDA 5

CCP-TP-091, attachment 18 requires TAL ions to be +/- 20% between the reference spectrum and the sample spectrum. SW-846, method 8260 B, section 7.6.1.3 requires +/- 30% ion matching.

CCP-TP-091, attachment 18 was revised to use the limits of +/- 30%. The audit team reviewed the changes and determined they were acceptable.

CDA 6

The Software Information Summary (Software Inventory List) needs to be updated to show the requirement of software application HGASCAL Rev2.xls, which has been superseded by HSG03-A2.xls.

The Software Information Summary (Software Inventory List) was updated to HSG03-A2.xls. The audit team reviewed the changes and determined they were acceptable.

CDA 7

CCP-TP-102, R.1, CCP-RTR #2 Radiography inspection operating procedure does not direct the operator to look for sharp objects presenting a penetration potential or bracing of heavy objects as required by the TRAMPAC section 2.7. The Site Project Quality Assurance Officer (SPQAO) checklist addresses the criteria in item 23 using the RTR description of contents. However, the RTR procedure should have specifically addressed this requirement.

CCP-TP-102 was revised to address the requirement. The audit team reviewed the changes and determined they were acceptable.

Observations

The audit team did not make any Observations as a result of the audit.

6.3 Recommendations

The audit team provided the following Recommendations to CCP management for consideration, concerning improvement of CCP processes and procedures.

Recommendation 1

Procedure CCP-TP-090 is titled *CCP Headspace Gas sampling Using the Automated Manifold System*. The use of the word "manifold" in the title of this procedure is inaccurate – the system is actually an "on-line integrated" system. In the WAP, there are requirements for a "manifold" system that are not 100% applicable to an on-line system.

Recommend changing the procedure title to accurately describe the system being used.

Recommendation 2

The PDP approval letter dated 4/28/04 identifies and authorizes HSG Sample Analysis for LLNL/CCP using instrument "HGAS-05". All forms in the headspace BDRs identify sample analysis being done on instrument "HSG-05".

Recommend informing the PDP coordinator that the system being used is "HSG-05".

Recommendation 3

"HGAS System Software" software information summary line items show adequate status of these applications.

Recommend that notes be added to each line item to indicate the major components of the suite (e.g., add "HGAS II.exe", "HGAS II121.bin", and Analysis.exe" component names to the "HGAS System Software" line item). This will provide notification to users of all major components that are installed for the suite. The inventory is adequate as presented and the recommendation is to show these two line items in a way that is similar to other suite/component items are shown on the inventory.

Recommendation 4

CCP technical supervision provides review of training materials, but there is no method to document the review on the qualification card.

Recommend that a signature/date line be added to the qualification card to document this review.

Recommendation 5

Recommend the following changes to the LLNL AK Summary Document, CCP-AK-LLNL-001 R.O. These changes will correct typographical errors and/or omissions and will provide clarity to understanding the AK record for the subject waste streams. These changes have been discussed individually and in detail with the CCP AK expert during the audit.

- a) Correct errors in the table of contents. Sections have been repeated.
- b) Page 12: The list of EPA Hazardous Waste Codes for LL-M001-S5400 needs to be compared to table 5-4 on page 70 to ensure consistency. D018 was inadvertently omitted from table 5-4 and should be added. It is noted that D018 is justified in the text on page 78.
- c) Page 20, paragraph 2: Add text to indicate why shipments of TRU waste to the Nevada Test Site (NTS) were not restarted.
- d) Page 20, section 4.3.1: Provide clarification regarding the term "combined TRU waste." In addition, clarify when California codes are added to the waste stream description and paperwork.
- e) Page 22, section 4.4.1, 2nd paragraph: The last sentence could give the reader the impression that this is truly a quantitative measurement of both radionuclides and hazardous constituents. It is recommended that the sentence be modified to note that this is at best a semi-quantitative process.
- f) Page 26, section 4.5: Clarify that the first two paragraphs are only a source of AK information and that the CCP certification plan will be the controlling document for certifying LLNL TRU waste. Modify the 4th sentence of paragraph 1, "The LLNL Radioactive Waste Program now includes TRU waste", to indicate past tense.
- g) Page 27, section 5.0, bullet 3: Text should be added to this section and section 5.4.3 to expand upon the process knowledge evaluation (PKE) process and how it has been effectively utilized by LLNL staff to justify not assigning hazardous waste codes to waste parcels removed from processes/boxlines that contain or could contain hazardous constituents.
- h) Page 35, paragraph 3: The text in this paragraph is confusing and neither reflects or is supported by information in other sections of the AK summary. This text should be revised to indicate that the AK record is supportive of the hazardous waste numbers (HWNs) and radionuclide mixes applied, and no significant gaps in AK information are identified.
- i) Page 35, paragraph 4: Clarify that the graphite molds are classified TRU waste and what their fate will be. Correct the reference at the end of the paragraph.

- j) Page 35, paragraph 5: The AK Source documentation indicates that any commercial TRU waste, such as that from the Plowshare Program, will be commingled with defense waste. Change the tense in the referenced text to reflect that the Plowshare waste has already been commingled.
- k) Page 64, section 5.4.1.2: The text needs to be clarified in this section. Where soil is mentioned, the text needs to indicate that the drums are not full of soil from some environmental restoration activity, but rather small samples from the analysis of underground nuclear test shots. This is not S4000 waste.
- l) Page 72, section 5.4.3, et al., see item 7: Discussions with the AKE and objective evidence reviewed indicate how codes are added to the process; however, this was not fully documented in this section of the AK summary. Expand the discussion of the PKE to demonstrate and justify how codes are added/not added to waste items exiting the box line from areas where hazardous materials are/may be present.
- m) Page 86: Develop a crosswalk for the record between the NTS and LLNL AK source document reference list.

7.0 ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit

Attachment 2: CCP Documents/Procedures Evaluated During the Audit

Attachment 3: Corrective Action Supporting Documentation

Attachment 4: Objective Evidence

PERSONNEL CONTACTED DURING THE AUDIT				
NAME	TITLE/ORG	PRE AUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
Alvord, Bob	DOE/ESD	X		
Anson, Jim	Field Operation Supervisor			X
Behanna, James	NDA Operator		X	X
Billett, Bob	LLNL/ CCP PM/VP	X	X	X
Chiulli, Joshua	NDA Operator		X	X
Coburn, Tony	RCA LLNL		X	X
DeMicco, Mike	QA Manager, RHWM			X
DiSabatino, Al	Acting Division Manager LLNL/EPD	X		X
Djordjevic, Sinisa	SQA Weston/CCP		X	
Doherty, Mark	AK/CCP		X	
Donohoue, Tom	NDA Operator		X	X
Ewing, Steve	NDE SME MCS	X	X	
Fisher, A.J.	CCP QA Manager	X	X	X
Freeze, Deborah	CCP Training Specialist	X	X	X
Gillespie, Bruce	NDA MCS	X	X	
Goodwin, Stephanie	Division Leader RHWM	X		X
Haar, Dave	CCP Program Manager	X	X	X
Harrison, Jeff	Acceptable Knowledge Expert	X	X	X
Hedahl, Tim	Manager, NTP	X		

PERSONNEL CONTACTED DURING THE AUDIT				
NAME	TITLE/ORG	PRE AUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
Hollister, Rod	RHWM Transuranic Project Manager	X	X	X
Jensen, Michelle	CCP/L&M/Records		X	
Kirkes, Billy	SPM CCP	X	X	
Kong, Robert	DOE/WM Project Manager	X		X
Lamb, Greg	RTR Operator		X	X
Lamb, Larry	RTR Operator			X
Loft, Mike	LLNL HGAS Technician		X	
Machado, Richard	NDA MCS	X	X	X
Michels, Ron	WCP GAO LLNL	X		
Medlin, Beverle	HSG Operator			X
Mooney, Dean	CCP SPQAO	X	X	X
Nance, Sherri	CCP SPQAO		X	
Padilla, Harvey	HSG Operator		X	X
Pearcy, Sheila	Lead CCP Records Custodian	X	X	X
Pelleginni, William	EPD/HWM		X	
Pennala, Eric	NDE/NDA MCS	X		
Perkins, Brian	Waste Certification Program	X		X
Porter, Larry	SPM CCP/WTS	X	X	
Romo, Abraham,	Visual Exam Expert CCP	X	X	X
Romo, Favian	VE Operator		X	X

PERSONNEL CONTACTED DURING THE AUDIT				
NAME	TITLE/ORG	PRE AUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
Rossman, Jerry	EPA Contractor	X		
Slininger, Brad	LLNL HGAS Technician		X	
Stepzinski, Charles	CCP Tech. Writer, L&M	X	X	X
Stroble, J. R.	CCP/WTS, WCO Manager, Project Cert.	X	X	
Vukelich, John	Training Manager RHWM	X		
Walker, LJ	VEE CCP		X	X
Warner, Roy	TRU Waste Coordinator			X
Williams, Michael	HSG CCP/WTS	X	X	X
Warwick, Keith	DOE Facility Representative	X		X

Procedure Number/Rev	DOCUMENT TITLE
CCP-PO-001/R8	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002/R9	CCP Transuranic Waste Certification Plan
CCP-PO-008/R4	CCP Quality Assurance Administrative Program
CCP-PO-014/R2	CCP LLNL Interface Document
LLNL Statement of Work	Lawrence Livermore National Laboratory Statement of Work for Characterization of LLNL TRU Waste
CCP-QP-002/R15	CCP Training and Qualification Plan
CCP-QP-005/R9	CCP TRU Nonconforming Item Reporting and Control
CCP-QP-008/R9	CCP Records Management
CCP-QP-019/R2	CCP Quality Assurance Reporting to Management
CCP-QP-021/R3	CCP Surveillance Program
CCP-QP-028/R5	CCP Records Filing, Inventorying, Scheduling, and Dispositioning
CCP-TP-001/R10	CCP Project Level Data Validation and Verification
CCP-TP-002/R13	CCP Reconciliation of Data Quality Objectives
CCP-TP-003/R14	CCP Sampling Design and Data Analysis for RCRA Characterization
CCP-TP-005/R13	CCP Acceptable Knowledge Documentation
CCP-TP-028/R2	CCP Radiographic Test and Training Drum Requirements
CCP-TP-030/R11	CCP TRU Waste Certification & WWIS Data Entry
CCP-TP-033/R5	CCP Shipping of CH TRU Waste
CCP-TP-041/R10	CCP Preparing and Handling Waste Drum for Visual Examination
CCP-TP-056/R2	CCP HSG Performance Demonstration Plan
CCP-TP-090/R2	CCP Headspace Gas Sampling Using the Automated Manifold System
CCP-TP-091/R0	CCP HSG Data Generation and Batch Data Reporting using the Automated system
CCP-TP-102/R1	CCP RTR #2 Radiography Inspection Operating Procedure
CCP-TP-104/R1	CCP Preparing and Handling Waste Drums for Headspace Gas at Lawrence Livermore National Laboratory

Procedure Number/Rev	DOCUMENT TITLE
CCP-TP-104/R1	CCP Preparing and Handling Waste Drums for Headspace Gas at Lawrence Livermore National Laboratory
CCP-TP-105/R1	CCP Container Management at Lawrence Livermore National Laboratory
CCP-TP-114/R2	CCP-Waste Visual Examination